

PROCEEDINGS
OF
THE ROYAL SOCIETY.

1847.

No. 70.

November 25, 1847.

GEORGE RENNIE, Esq., Treasurer, in the Chair:

His Grace the Duke of Wellington was elected a Fellow of the Society.

Postscript to Mr. W. H. Barlow's paper on Alternating Diurnal Currents of Electricity at the Terrestrial Surface.

The author states that since his paper was read to the Society, he had made further experiments to determine with greater accuracy the direction in which the daily electrical currents travel, and also how far the motions of the horizontal magnetic needle correspond with that of the telegraph. With regard to the latter, he finds that although they agree as to the general character of their deflexions, there is no decided simultaneous coincidence in their movements.

"Magnetical experiments on board H.M. Iron Steam Vessel 'Bloodhound.'" By Captain Edward Johnson, R.N., F.R.S. Communicated to the President by the Lords Commissioners of the Admiralty, and communicated to the Society by the President.

These experiments were undertaken with the view of ascertaining whether the action of steam upon the hull of an iron vessel affects a compass, properly placed, in any degree that may be of practical importance in its navigation; and also whether the keeling of the vessel produces any alteration in the deviations, or disturbs a compass so placed to any considerable extent. The former question is, from the results of these experiments, resolved in the negative; but with respect to the second, it appears that the deviations produced by keeling are very marked, and could not be safely disregarded. These observations completely confirm those already made by Mr. Walker and Commander Shaugh on board H.M. Iron Brig 'Recruit,' Commander A. Slade, and they prove the necessity that exists for ascertaining the deviations of the compass in all ships, not only at the beginning and end of their voyage, but likewise at intermediate

stations; as also constant observation of the course which the ship may be steering.

December 16, 1847.

Sir ROBERT HARRY INGLIS, Bart., V.P., in the Chair.

“Thirteenth Series of Tide Researches.” By the Rev. William Whewell, B.D., F.R.S.

The first part of this paper, “*On the Tides of the Pacific*,” forms a sequel to former papers by the same author, especially to his first memoir on this subject, printed by the Royal Society in 1833 (‘Essay towards a first approximation to a map of Cotidal Lines’), and to the *Sixth Series* published in 1836 (‘Results of an extended series of Tide Observations made on the coasts of England and America in June 1835’). Among the results obtained in the latter paper, it appeared that all the “cotidal lines” which have been most exactly traced, meet the coast at a very acute angle; and for that and for other reasons stated in other memoirs, the drawing of cotidal lines across wide oceans is a very precarious process. In addition to this consideration, the scantiness of our materials has hitherto made it impossible to trace the tides of the Pacific in a connected form; and the absence of lunar tides in the central parts of that ocean (as at Tahiti) makes it difficult to represent the course of the tides by means of cotidal lines at all. We are thus led to consider in what other way the course of the tides over wide spaces may be represented: and it is stated by the author, that either a *stationary undulation*, or a *rotatory undulation*, of the central parts of an ocean, with a border of cotidal lines proceeding outwards from the central undulation into bays and arms of the sea, would represent, in a great measure, the tidal phenomena of the Atlantic and Pacific, as far as they are known. The *rotatory undulation* here spoken of need not be understood to be a *rotatory motion* of the water, but a geometrical rotation of the cotidal line, such as takes place in the German Ocean; the tide in the central part (that is, the rise and fall of the surface) vanishing, as was shown by the observations of Capt. Hewett, though the tidal currents at that point alternate regularly. Such a movement of the cotidal line may perhaps represent the phenomena of the North Pacific.

The author has collected materials for a Tide Map of the Pacific from various navigators;—Cook, Flinders, King, Captains FitzRoy, Sir E. Belcher, Sir James Ross, Stokes, Killet, and others of our own countrymen; Malaspina, Freycinet, Du Petit-Thouars, Wrangel and Admiral Lütke, and other Spanish, French and Russian navigators. The result of these appears to be, that on the eastern coast of the Pacific, the tide comes from the west; arrives first at the coast near Acapulco and Nicoya, and is later and later both to the north and to the south of this point; passing to the eastward round Cape Horn, as observed by King, and to the northward along the coast